

REMARKS

Claims 1 and 15 are amended herein. Support for the amendment to Claim 1 is found in the specification, for example, at paragraph [0028]. Support for the amendment to Claim 15 is found in the specification, for example, in the Examples, Comparative Examples and Figures, and paragraphs [0058]-[0062]. No new matter is added by the amendments.

Claim 14 is canceled herein without prejudice to, or disclaimer of, the subject matter contained therein. Applicants maintain that the cancellation of a claim makes no admission as to its patentability and reserve the right to pursue the subject matter of the canceled claim in this or any other patent application.

New Claim 16 is added herein. Support for new claim 16 is found in the specification, for example, at paragraph [0027]. Accordingly, new Claim 16 does not add new matter.

Upon entry of the amendment, Claims 1, 2, 5, 7-10, 12, 15 and 16 are under examination.

Rejection of Claim 15 under 35 U.S.C. § 112, second paragraph

The Office Action rejects Claim 15 as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention. In particular, the Office Action states that the phrase “relative to a film” is unclear in scope.

Without acquiescing to the rejection, but in order to expedite prosecution, Applicant has amended Claim 15 to replace the objected-to term with the term “compared to a film.” The standard for comparing to the reference film as recited in Claim 15 is taught in the specification, for example, in the Examples, Comparative Examples and Figures, and paragraphs [0058]-[0062]. Accordingly, Applicants submit that Claim 15, as amended, is clear and definite. Withdrawal of the rejection is respectfully requested.

Rejection of Claims 1, 2, 5, 7-10, 12, 14 and 15 under 35 U.S.C. § 103 over Minegishi and Ross

The Office Action rejects Claims 1, 2, 5, 7-10, 12, 14 and 15 under 35 U.S.C. § 103 as being obvious over Minegishi (US Pub. No. 2003/0094409) in view of Ross (US Pat. No. 6,521,690). In particular, the Office Action states that Minegishi discloses the steps of dissolving

poly(vinylidene fluoride) based resin and then cooling, and Ross teaches a modified smectite clay.

No combination of Minegishi and Ross renders the presently pending claims obvious because no combination of the references teaches all claim elements. In particular, no combination of the references teaches use of an organized clay in the form of grains having an average particle size of 0.01 to 0.3 μm in a method of producing a porous film.

Claim 1 as presently pending recites, *inter alia*, that the organized clay is in the form of grains having an average particle size of 0.01 to 0.3 μm .

The Office Action points to Example 1 of Ross as teaching use of a hectorite clay ground to less than 325 mesh. As indicated by the Office Action, a substance that is ground to less than 325 mesh is a substance having particles that measure less than 44 micron. Thus, Example 1 of Ross teaches a single use of a hectorite clay having particles that measure less than 44 micron. However, Ross provides no teaching of the preferred particle size or a desired range of particle sizes. The Office Action states that this use of hectorite clay ground to less than 325 mesh overlaps with an organized clay in the form of grains having a particle size of 0.01 to 0.3 μm . However, a single use of hectorite clay ground to less than 325 mesh does not read on an organized clay in the form of grains having an *average* particle size of 0.01 to 0.3 μm . The teaching of the single use of ground hectorite clay in Example 1 is a teaching of a single, non-disclosed average particle size, and is not a teaching of a range of average particle sizes. As such, the single use teaching of Ross in Example 1 is a teaching of a single average particle size, not a range of average particle sizes that is capable of overlapping with other ranges of average particle sizes. There is no evidence that the single average particle size taught in Example 1 of Ross falls within the range recited in Applicants' claims. Accordingly, there is no evidence that this claim element is taught by Ross.

Furthermore, Ross does not teach any particular reason for use of particles less than 325 mesh, nor the importance of any particular average particle size. Accordingly, Ross provides no general teachings of particle size of the hectorite clay, and Ross does not teach that use of a hectorite clay ground to less than 325 mesh provides any particular advantage. Therefore, Ross does not teach that average particle size is a result-effective variable. Accordingly, the average

particle size recited in Applicants' claims would not be a matter of obvious optimization of Ross's teachings.

In contrast, Applicants have taught that use of a hydrophilic organized clay having an average particle sizes of 0.3 μm or lower provides improved dispersion over particles larger in size. In particular, Example 1 of the present application teaches that when an organized clay being hydrophilic and having a good dispersion property is used, the hydrophilic property will be improved, and also a microstructure will be obtained having an irregularly shaped resin phase continuous in a three-dimensional manner and having irregularly shaped pore spaces therebetween (See FIG. 1). On the other hand, when a hydrophilic organized clay is not used (Comparative Example 1), the hydrophilic property is not improved, and the structure was a spherical crystal structure (See FIG. 2). Ross does not teach the size of the organized clay or the superior qualities resultant from its use in producing a porous film. In fact, Ross teaches nothing regarding producing a porous film. Thus, use of Applicants' compounds provides a method of forming for producing a porous film that is superior to and unexpected over the teachings of Ross.

Minegishi does not teach that which is lacking in Ross. In particular, Minegishi teaches nothing regarding the desirability of using a clay, much less the average particle size thereof. Accordingly, no combination of Minegishi and Ross teaches all elements of Claim 1 or claims dependent therefrom.

Moreover, if anything, Minegishi teaches away from the claimed methods. Minegishi teaches the undesirability of using inorganic particles, and the invention of Minegishi avoids use of inorganic particles. In particular, Minegishi teaches:

The melt extraction process yields a relatively uniform, high-strength membrane with no macrovoids; however, poor dispersion of the inorganic particles can cause defects such as pinholes. Furthermore, the melt extraction process has a disadvantage of extremely high production cost. *Minegishi* at paragraph [0007].

Thus, Minegishi teaches the undesirability of methods that use inorganic particles because these methods result in "defects such as pinholes" and have "extremely high production cost." Minegishi avoids the use of inorganic particles by discharging a polyvinylidene fluoride solution comprising a polyvinylidene fluoride resin and a poor solvent at a temperature above a phase separation temperature into a cooling bath at a temperature below the phase separation

temperature to coagulate the polyvinylidene fluoride resin. *Minegishi* at paragraph [0010]. One of ordinary skill in the art would be led by the teachings of *Minegishi* to avoid use of inorganic particles in order to avoid the adverse consequences of using inorganic particles taught by *Minegishi*. Accordingly, one of ordinary skill in the art would be motivated by the teachings of *Minegishi* to avoid using an organized clay due to the adverse consequences taught by *Minegishi*. Therefore, the teachings of *Minegishi* would lead one of ordinary skill away from Applicants' claimed method.

The Office Action responds to the above by stating that *Minegishi* only teaches avoiding poor dispersion of inorganic particles. The Office Action further states that *Minegishi* teaches "inorganic materials dispersed in polymer compositions."

However, *Minegishi* teaches clearly teaches the undesirability of using inorganic particles because use of inorganic particles results in "defects such as pinholes" and have "extremely high production cost." Although *Minegishi* provides a reason why inorganic particles provide these undesirable results, this does not alter the fact that *Minegishi* teaches away from using inorganic particles. Moreover, the invention of *Minegishi* avoids use of inorganic particles. To incorporate inorganic particles would be contrary to the invention of *Minegishi* and contrary to *Minegishi*'s teachings of the undesirability of inorganic particles. Accordingly, it would be contrary to the teachings of *Minegishi* to use a clay in a method of forming a porous film.

In regard to the teachings of *Minegishi* cited in the Office Action as using "inorganic materials dispersed in polymer compositions," *Minegishi* teaches use of inorganic salts as "additives that can shift the crystallization temperature T_c of the stock solution." *Minegishi* at paragraph [0032]. This teaching of *Minegishi* does not mention that the inorganic salts are "dispersed in polymer compositions" as described in the Office Action. To the contrary, this teaching of *Minegishi* would lead one of ordinary skill to believe that the inorganic salts would be *dissolved* in order to influence T_c . Therefore, this teaching of *Minegishi* would not be considered a teaching of inorganic particles *dispersed* in the stock solution. Further, since the inorganic salts would be considered to be solutes, one of ordinary skill would not expect these dissolved inorganic salts to be incorporated into the final product. Accordingly, this teaching of *Minegishi* would not be considered as teaching an organized clay such as that recited in

Applicants' claims. Thus, one of ordinary skill would not consider Minegishi to teach this element of Applicants' claims.

Furthermore, Minegishi teaches away from any combination with Ross. Ross teaches an organic chemical/smectite clay intercalate that has been ion-exchanged and reacted and intercalated with one or more quarternary ammonium compounds and an anionic material and further blended into a polymer resin to make a nanocomposite composition. *Ross* at Abstract. However, as provided above, Minegishi teaches avoiding methods that use inorganic particles because these methods result in adverse consequences. As such, Minegishi teaches avoiding materials such as Ross' smectite clay. Accordingly, Minegishi teaches away from its combination with Ross. Therefore, Minegishi and Ross cannot be properly combined to render obvious Claim 1 or claims dependent therefrom.

In view of the above, Applicants respectfully request removal of the obviousness rejection of Claims 1, 2, 5, 7-10, 12, 14 and 15.

Claim 16 is Further Non-Obvious Over the References

Claim 16 is further non-obvious over the cited references because Ross teaches away from Claim 16. Claim 16 is directed to the method for producing a porous film according to claim 1, where the hydrophilic compound is selected from the group consisting of an organic onium ion-containing compound and an alkylene oxide-containing compound. Ross teaches the importance of including an organic anion in the clay. Thus, Ross teaches away from a claim reciting that the hydrophilic compound is selected from the group consisting of an onium ion-containing compound and an alkylene oxide-containing compound. Accordingly, Claim 16 is further non-obvious over the cited references.

No Disclaimers or Disavowals

Although the present communication may include characterizations of claim scope or referenced art, Applicant is not conceding in this application that pending claims are not patentable over the cited references. Rather, any characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed

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herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

CONCLUSION

The present application is believed to be in condition for allowance, and an early action to that effect is respectfully solicited. Applicants invite the Examiner to call the undersigned if any issues may be resolved through a telephonic conversation.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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